

What is claimed is:

1. A method of manufacturing a crystal of a III-V compound of the nitride system, the method including:

a first growth step of forming a first crystal layer by growing a crystal of a III-V compound of the nitride system on the surface of a basal body;

a first mask forming step of forming a first mask pattern on the surface of the first crystal layer;

a first etching step of etching the first crystal layer through the first mask pattern;

a second growth step of forming a second crystal layer by growing a crystal of a III-V compound of the nitride system from the first crystal layer;

a second mask forming step of forming a second mask pattern on the surface of the second crystal layer;

a second etching step of etching the second crystal layer through the second mask pattern; and

a third growth step of forming a third crystal layer by growing a crystal of a III-V compound of the nitride system from the second crystal layer.

2. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

further including:

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between the second etching step and the third growth step,
a step of removing at least part of the second mask pattern.

3. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 2,

wherein the first mask pattern at least includes an under layer formed over the first crystal layer and an upper layer formed over the under layer.

4. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 3,

wherein the upper layer of the first mask pattern, and the second mask pattern are formed of a material which can be dissolved by the same solution, and

the under layer of the first mask pattern is formed of a material which cannot be dissolved by the solution.

5. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

wherein windows of the first mask pattern and windows of the second mask pattern do not overlie one another in the direction of the thickness of the crystal.

6. A method of manufacturing a crystal of a III-V compound of the

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nitride system as claimed in claim 1,

wherein windows of the first mask pattern and windows of the second mask pattern at least in one place overlies one another in the direction of the thickness of the crystal, and at least in another place do not overlies one another in the direction of the thickness of the crystal.

7. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

further including:

after the third growth step,

a step of separating a portion of the crystal which includes at least the basal body, from the crystal.

8. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

wherein an inner layer is formed at least in one of the first crystal layer, the second crystal layer and the third crystal layer, and the inner layer has a different composition from the crystal layer in which the inner layer is formed.

9. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 8,

wherein the inner layer includes a III-V compound of the nitride system.

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10. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

wherein each of the first mask pattern and the second mask pattern includes a plurality of pattern elements arranged in one direction in a plane almost parallel to the surface of the basal body.

11. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 10,

wherein both the pattern elements of the first mask pattern and the pattern elements of the second mask pattern are in the form of stripes.

12. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

wherein each of the first mask pattern and the second mask pattern includes pattern elements arranged in two directions in a plane almost parallel to the surface of the basal body.

13. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 1,

wherein each of the first mask pattern and the second mask pattern includes silicon (Si) and at least one selected from the group consisting oxygen (O) and nitrogen (N).

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14. A method of manufacturing a crystal of a III-V compound of the nitride system as claimed in claim 13,

wherein the basal body comprises at least one of sapphire (Al_2O_3), silicon (Si), silicon carbide (SiC), gallium arsenide (GaAs), magnesium aluminum composite oxide (MgAl_2O_4), lithium gallium composite dioxide (LiGaO_2) and gallium nitride (GaN).

15. A method of manufacturing a device, the method including a crystal growth step of forming a crystal substrate or a crystal film and comprising manufacturing a device by forming a predetermined device film over the crystal substrate or the crystal film,

wherein the crystal growth step includes:

a first growth step of forming a first crystal layer by growing a crystal of a III-V compound of the nitride system on the surface of a basal body;

a first mask forming step of forming a first mask pattern on the surface of the first crystal layer;

a first etching step of etching the first crystal layer through the first mask pattern;

a second growth step of forming a second crystal layer by growing a crystal of a III-V compound of the nitride system from the first crystal layer;

a second mask forming step of forming a second mask pattern on the surface of the second crystal layer;

a second etching step of etching the second crystal layer through the

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second mask pattern; and

a third growth step of forming a third crystal layer by growing a crystal of a III-V compound of the nitride system from the second crystal layer.

16. A method of manufacturing a device as claimed in claim 15, further including

a step of separating the basal body from the crystal substrate or the crystal film.

17. A crystal substrate of a III-V compound of the nitride system including a plurality of crystal layers of a III-V compound of the nitride system, wherein the plurality of crystal layers include:

a first crystal layer having first windows;

a second crystal layer which is formed over the first crystal layer and has second windows or grooves; and

a third crystal layer formed over the first crystal layer and the second crystal layer.

18. A crystal substrate of a III-V compound of the nitride system as claimed in claim 17,

wherein the first windows and the second windows or grooves at least partly do not overlie one another in the direction of the thickness of the crystal substrate.

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19. A crystal substrate of a III-V compound of the nitride system as claimed in claim 17,

wherein the second crystal layer is formed by crystal growth from the walls of the first windows.

20. A crystal substrate of a III-V compound of the nitride system as claimed in claim 17,

wherein a mask pattern is formed on the surface of the first crystal layer.

21. A crystal substrate of a III-V compound of the nitride system as claimed in claim 17,

wherein both the first windows, and the second windows or grooves are more than one in number and are in the form of stripes.

22. A crystal substrate of a III-V compound of the nitride system as claimed in claim 17,

wherein both the first windows, and the second windows or grooves are in the form of polygons.

23. A crystal substrate of a III-V compound of the nitride system as claimed in claim 17,

wherein at least one of the first crystal layer, the second crystal layer

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and the third crystal layer comprises an inner layer of a III-V compound of the nitride system having a different composition from the crystal layer in which the inner layer is formed.

24. A crystal film of a III-V compound of the nitride system including a plurality of crystal layers of a III-V compound of the nitride system, wherein the plurality of crystal layers include:

a first crystal layer having first windows;

a second crystal layer which is formed over the first crystal layer and has second windows or grooves; and

a third crystal layer formed over the first crystal layer and the second crystal layer.

25. A crystal film of a III-V compound of the nitride system as claimed in claim 24,

wherein the first windows and the second windows or grooves at least partly do not overlie one another in the direction of the thickness of the crystal film.

26. A crystal film of a III-V compound of the nitride system as claimed in claim 24,

wherein the second crystal layer is formed by crystal growth from the walls of the first windows.

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27. A crystal film of a III-V compound of the nitride system as claimed in claim 24,

wherein a mask pattern is formed on the surface of the first crystal layer.

28. A crystal film of a III-V compound of the nitride system as claimed in claim 24,

wherein both the first windows, and the second windows or grooves are more than one in number and are in the form of stripes.

29. A crystal film of a III-V compound of the nitride system as claimed in claim 24,

wherein both the first windows, and the second windows or grooves are in the form of polygons.

30. A crystal film of a III-V compound of the nitride system as claimed in claim 24,

wherein at least one of the first crystal layer, the second crystal layer and the third crystal layer comprises an inner layer of a III-V compound of the nitride system having a different composition from the crystal layer in which the inner layer is formed.

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